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Your friend E. Miller

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# MILLER'S

# TRUSSED PLATFORMS,

## COMPRESSION BUFFERS

AND

## AUTOMATIC COUPLERS.

THE STANDARD AMERICAN SYSTEM

OF MAKING UP

## RAILROAD PASSENGER TRAINS.

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PATENTED MARCH 31ST, 1863, JANUARY 31ST, 1865, and JULY 24TH, 1866.

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BY E. MILLER,

CIVIL ENGINEER.

NEW YORK:
BAKER & GODWIN, PRINTERS,
No. 25 PARK ROW.
1873.

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# NOTE.

HAVING at various times been informed that certain persons, unknown to me, have used my name, and represented themselves as the veritable "Platform Miller," for the purpose of obtaining favors from railroad officials and others; and that, in several instances, sums of money and railway passes have been thus obtained; therefore, I am constrained to insert this note—though much to my regret—warning all railway men against being thus imposed upon. I also preface this book with a likeness of myself, which will aid in the detection of any who may attempt to counterfeit me in person.

Agents from me will, in all cases, bear a letter of my own handwriting, the signature of which will correspond with that accompanying the likeness.

E. M.

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# INTRODUCTION.

Four years have now elapsed since the publication of my last pamphlet on the subject of Platforms, Buffers, and Couplers for Railroad Cars, and many noteworthy changes have taken place in railroad matters during the interim; changes developing a rapid progress in the opening of railways in every part of the country, covering it, as it were, with a vast network of lines of rapid transit. With these changes, improvements in tracks, locomotives, cars, and all the paraphenalia of railroading, have been introduced, and, at this writing, it may safely be said that we possess the finest railway system in the world.

But while various improvements have been made in the minor details of cars, there has been no change in platforms, other than the adoption of my Improvements, which are now rapidly coming into general use; and I see no reason to doubt of their becoming the Standard National System of making up passenger trains in this country.

The great saving of life and property, which is directly traceable to them, the ease and comfort to passengers, and the attainment of a higher rate of speed, with much less degree of danger, than in the old style of coupling, has been proven to the entire satisfaction of all railway corporations using these improvements, as the certain results of their use. The change from the old style of platform and coupling to the new has been gradually increasing in rapidity, until I find my entire time is taken up in attending to the every-day duties at my office; and this, with the great number of letters I daily receive, the published reports of accidents in which the platforms have been the means of saving life, and the kind regards of railroad managers, assures me that the end for which I have labored so many years is to be fully realized, and that I am doing something of great importance



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for the good of my fellow-men; something that renders travel safer and more agreeable, and lessens to a very great degree the number of fatal accidents with which our railway system has been afflicted.

This, to me, is a great satisfaction from a humanitarian point of view, and also—though not more so—a satisfaction to know that my railroad friends, as well as myself, are reaping the fruits of the application of the Improvements.

Notwithstanding the Improvements are now in use on more than TWO HUNDRED RAILROADS, and new and old ones are adopting them daily, I have thought best to come before the railroad public once more through the medium of a pamphlet or book, rewritten, revised, and improved, which they will find contains that more elaborate reasoning and statement of facts which only time and experience can give, conveying to the reader, in brief, some of the results obtained since the publication of my last. In this will be found the illustrated description of my plan of passenger-car TRUSSED PLATFORMS, COMPRESSION BUFFERS, AND AUTOMATIC COUPLERS, and their *operations* and *merits*, something of which are shown in the accompanying reports of presidents, superintendents, and other railroad officials. I also republish herein an illustrated description of "*Telescoping*," citing cases of this kind of accident, and cases of accident wherein "telescoping" was prevented by the use of my Platforms. I also give much space to the subject of "*Oscillation*," which I earnestly invite all to peruse carefully, for to *Oscillation* and *Telescoping* may be charged three-fourths of the sum of railroad accidents of all kinds.

I desire to call the attention of all railway officials to the subject-matter contained herein, and request that they give it a careful perusal. Especially do I ask this of presidents and superintendents, inasmuch as master car builders—who cannot leave their work to clerks—do not always find time to study these matters so thoroughly as to assure themselves as being infallible authority in advising radical changes in the building or equipping of cars. To make important and expensive changes, it is necessary for the car builders to get the consent of the managers of the road, and they (the managers) should qualify themselves to judge correctly before deciding a question of such great importance to all who ride on and all who operate railroads. A careful reading of this book will give them the necessary information as to the subjects mentioned, and hence I urge its importance to railroad officials of every grade.

Again, beware of *pretended* "*improvements*." *Millions of dollars* have been wasted in the thousand and one attempts to effect in *some*

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*other way* what these improvements accomplish with ease, accuracy, and safety; and of the thousands of patents granted for so-called "improvements" in "Draw Heads,"—not one of them worth anything,—but, on the contrary, are obstacles in the minds of incompetent judges to the early adoption of the improvements herein recommended. Particularly bear in mind that elevated platforms, with old-fashioned draw-heads for buffing, and taking the compression below the platforms, are but little, if any, better than the ordinary platforms, and they are not safe in collisions, as against telescoping, nor as against oscillation at high speed, &c., so do not let time and money be wasted in any such experiment.

Again, compression may be produced by *screws*, as in England, *just as soon as we build our roads and cars just exactly as they do in England*, AND NOT BEFORE! In this country compression by screws has often been tried, and has always failed; it always should and always will do so. I speak from experience; for I have myself spent a great deal of time and money in attempting to make the above experiments successful. I mention this so that you may not be induced to try it.

By the Miller improvements not only are the cars compressed together by the most simple method, and the couplings worked automatically, and links and pins dispensed with, but, also, the close connection brings the platforms so near together as to dispense with aprons and bridges between them, shut down the dust and prevent persons from falling between them, and all this is *permanent* and *durable*, requiring no repairs during the life of the car.

I further ask that all railroad officials will pay no heed to the pretended claims they may hear of, "rights of interference" of my patents, and that they do not defer action for reason of any such stories. I am quite often in receipt of letters from different parts of the country, from men who even claim that they have Letters-patent for the same devices for which I have patents, and claiming that I am infringing on their patents, and yet their names do not appear in the books at the Patent Office.

In every case I have found such claims to be groundless and villainous attempts at black-mailing. In one instance a railway superintendent was frightened into paying a sum of money to one of these sharpers, who pretended to show a patent for these improvements. These rascally attempts at swindling are not confined to educated and polished scoundrels who disgrace the profession of law; but are indulged in by a class perfectly equal to them in all respects, except

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education, as the following copy of a letter received recently through the mail clearly shows:

MARTELLE, IOWA, Feb y 8, 1873.

COL. E. MILLER, ESQ.

*Dear Sir*—I want you to explane how you com by my R. R. Car Coupling. A settlement will be easier com to now than any other time. My just rites I intend to have as near as I can.

Address—Lost Nation, Clinton Co., Iowa.

Yours, truly,

PHINEAS PELTON.

It is to be hoped that "Phineas," and all his co-workers in this iniquity, will obtain their "just *rites*"—"as near as" possible.

E. MILLER, C. E.,
*Inventor and Patentee of Improved Platforms, Couplers, and Buffers for Railroad Cars.*

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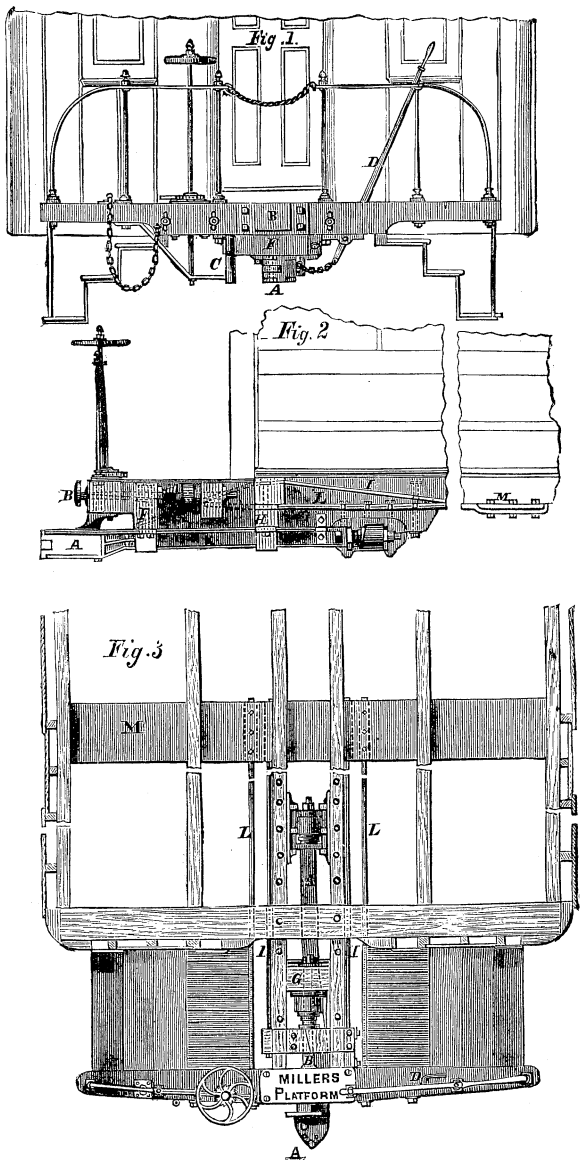


PLATE I.

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# DESCRIPTION.

FIGURE 1 is an elevation; Figure 2, a longitudinal section; Figure 3, a plan of an end of a car to which the arrangement has been applied.

The letters refer to the same parts in all the figures. A is the coupling "Hook;" B the "Buffer;" C the "Stop;" D the "Lever;" F the "Truss Beam;" G the "Spring Beam;" H the "Suspender Beam;" I the "Upward Trusses;" K the "Main Spring;" L the "Downward Trusses;" and M the "Bolster."

The platforms, instead of being located below the center line of the main sills of the cars, are placed *in* that line, and held there by the Trusses I and L, so that the point of contact (in Buffers B) is *in* the said center line and *not below it.*

The coupling "Hook" A is attached to the draw spring the same as the ordinary draw head, but in such a manner that the outer end is free to move laterally for a short distance. The Coupling Hook projects beyond the platform. The Stop C is placed under the Buffer Beam to prevent accidental uncoupling. When two cars are brought together, the Coupling Hooks, from *their shape*, push each other aside, until the Buffers B are compressed hard on the Buffer Springs, then—*the points of the Hooks having passed each other sufficiently far*—the Hooks are carried forward by their main-springs, and thus the "*Coupling*" and "*Compression*" are both effected automatically *and at the same time*, and without the use of links and pins. When two cars are thus coupled together, the *head* of the *Hook* of each car is under the Buffer Beam of its opposite car, and the platforms are close together (about 4 inches apart). The effect of this is, *one platform cannot be forced over the other*, nor can a *child* fall between the platforms; the dust and rain are nearly all shut out; the "Compression" makes the train run steadily, and prevents all jerking at starting and stopping. In short, the advantages gained by the use of these improvements may be summed up briefly, as follows:

1. The platforms are held in a plane with the sills of the cars.
2. The platforms cannot be broken by any ordinary accident.
3. *Telescoping* is entirely prevented.



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4. Any required compression may be attained, to prevent accidents by *Oscillation.*

5. No links and pins are required, and no one is required to go between cars to couple them.

6. The platforms may be held as close together as desired.

7. By close coupling the train is shortened.

8. They will not accidentally uncouple.

9. They may be uncoupled "*without shutting off*," to make a *flying switch.*

10. They very much reduce lateral and vertical unsteadiness of the cars.

11. They cause the train to move off steadily and not jerk in starting and stopping.

12. They work well at great variations of height.

13. They will couple with all kinds of "drawheads" and "couplers."

14. They are cheap and durable.

15. Injury to men when coupling cars is entirely prevented.

16. Injury to persons by falling between cars is entirely prevented.

17. Injury to persons and to cars by "*telescoping*" is entirely prevented.

18. Injury to persons and to cars by "*oscillation*" is entirely prevented.

19. The great steadiness of the cars—*produced by compression*—render sleeping-cars much more desirable.

20. "*Train Brakes*" are rendered more valuable by the non-existence of "*slack*" in the train.

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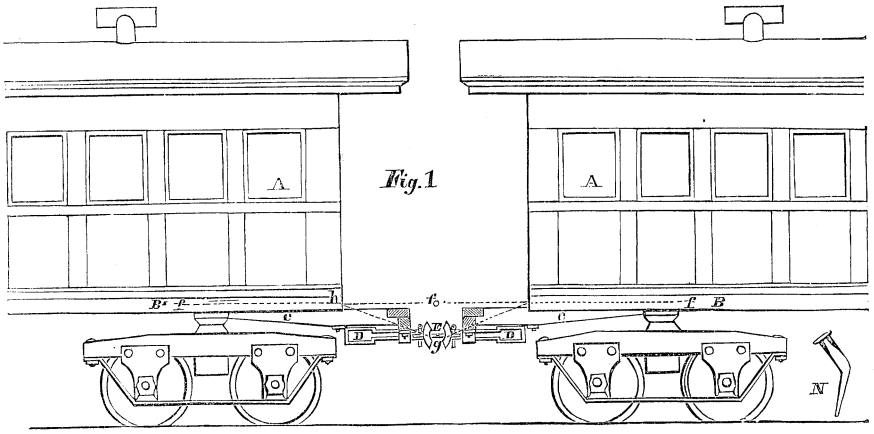


Fig. 1

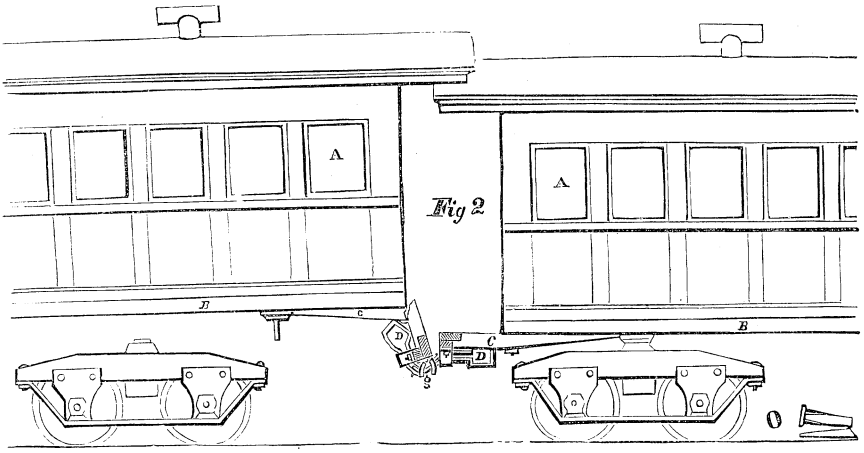


Fig 2

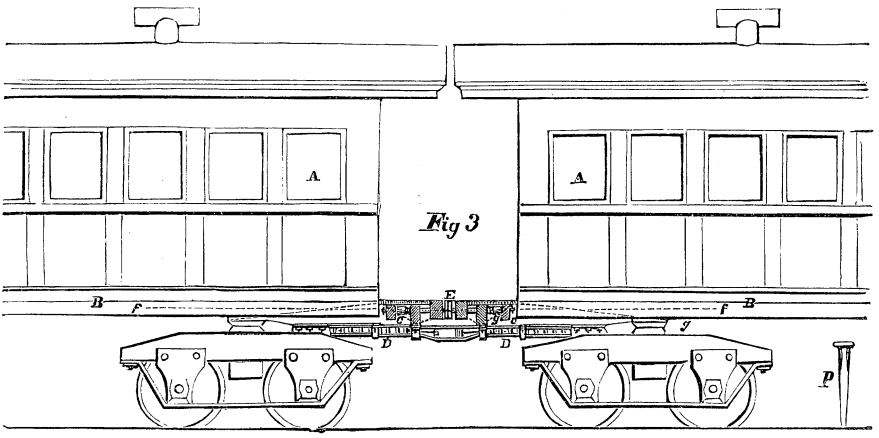


Fig 3

PLATE II.

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# "TELESCOPING."

THE word "telescoping" is used by railroad men to express that class of accidents which is *the running of cars into each other* like the joints of a telescope. Any sudden checking of a passenger train in motion *may*, and most generally *does*, under the old system of platforms, couplers, and buffers, *break off the platforms* of the cars and permit the ends of the car bodies to come in contact; and if the speed of the moving train is equal to ten or twelve miles per hour, the ends of the bodies of such cars are liable to be broken, and the cars to pass *into* and sometimes nearly or quite *through* each other! This is "*telescoping*" the cars. To make the subject more comprehensible, three outline cuts have been prepared, to accompany this description, which are thus explained:

Fig. 1 shows the mechanical errors in the construction and location of passenger-car platforms, and in the arrangement of the coupling and buffing apparatus.

A, A, are the car bodies; B, B, the sills of the cars; c, c, the platform sills; D, D, the drawheads—which serve also as buffers. E, the coupling link; f f'' f the centre line of the sills of the cars; g, the point of contact; and h, g, the line of depression from the centre line f f'' f to the point of contact at g.

These platforms are located *below* the sills of the cars, and the buffers far below the platforms, bringing the point of contact at g instead of at f''. This crook in the line f, h, g, will INSURE a broken platform, even in a slight collision. Some car builders have attempted to surmount this difficulty by making the platforms narrower, but this *increases the danger*, as it increases the angle at h.

Fig. 2 shows how a car, in a collision, is raised by a broken platform, and made to strike the opposite car *above its sills*, where nothing but light studding and paneling is encountered in its course into and through the same.

Fig. 3 shows the only method of construction of car platforms and the application of the coupling and buffing apparatus that accords with mechanical laws.

A, A, are the car bodies; B, B, the sills of the cars; c, c, the platform sills; D, D, a novel method of coupling without link or pin or



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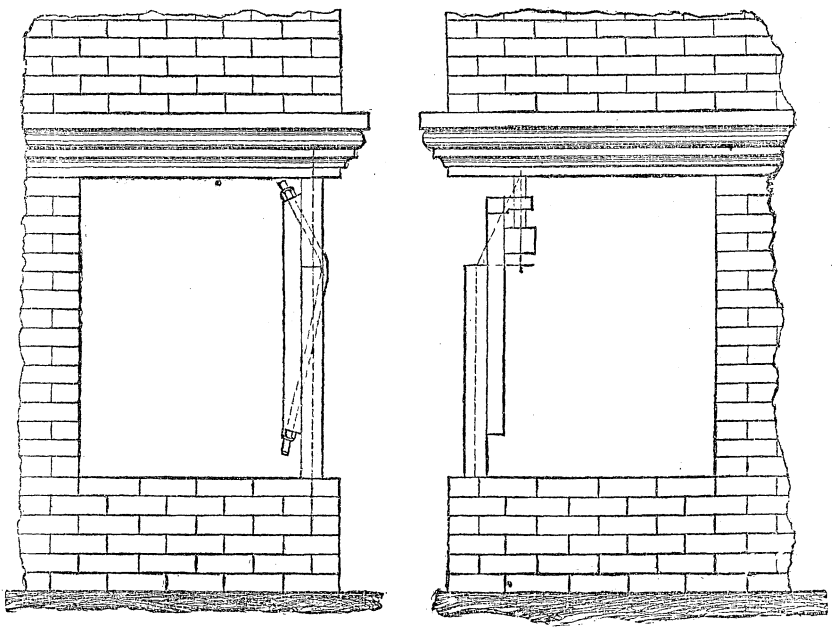
any substitute therefor, and entirely automatic in its operation; this kind of coupling is capable of being attached to any other kind, whether it is the same height or not. E, the buffer, is located *in the centre line* f f; these buffers—when the cars are coupled together—may be "compressed" as much as desired, or not at all, if preferred; g, g, shows the course of the truss rods that hold the platform in the plane of the sills of the cars.

Fig. 3 shows the *straight line* method of buffing; and any mechanic can see, at a glance, that it insures a platform that cannot be broken off by a collision.

The two methods may be plainly illustrated by taking a cut nail and bending it, as at N, Fig. 1, to correspond with the line f, h, g, Fig. 1; this crooked nail cannot be driven into a soft pine board; a light blow with a hammer will break it, as shown at O, Fig. 2; while a straight nail—as P, Fig. 3—may be driven with hard blows into the hardest kind of wood.

As a further illustration and in order to make this matter more clear, I give the following which embodies the true principles of strength and explains it very concisely.



For more than forty years, railroad passenger-cars have been constructed in this country with the same violation of mechanical prin-

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ciples that the house builder would be guilty of who should attempt to support the upper part of a house by means of a pillar whose lines of resistance to pressure from above would be as indicated on the right of the foregoing illustration. That column which looks as if about to give way under the weight that it is supposed to be required to sustain, represents simply the outlines of the old-fashioned car-platform, set upright. The column on the left, in which the lines are all direct, shows the application of the improved system of constructing the platforms of cars.

In the early days of railroading, the car-builders placed the bodies of the coaches about two feet and eight inches above the rail, and the draw-irons were placed in the center line of the sills, but as improvements were made, the bodies were raised higher, though the draw-irons were kept at the former level and combining both buffer and coupler, were placed beneath the platform in order to correspond and couple to the older cars.

Further improvements—still altering and raising the car bodies—made it necessary to place the platforms quite below the car sills, in order to sustain the draw-heads and still admit of their coupling at the height as above stated.

This illustrates the crude state of railroading and car building during the first twenty years of the existence of railways in this country; when, it may be said, they were in an "embryo" state. It also illustrates how one of the greatest violations of certain mechanical laws crept into being, and, in a few cases, is yet nursed and maintained as carefully as in its extreme infancy, before it became a giant in strength and could boast of its bloody victories; of having "slain its thousands."

By preventing "telescoping," we may avoid a large amount of loss of life and injuries to persons, and, at the same time, the loss of hundreds of thousands of dollars in damages to cars, &c. There is no kind of accident that does so much to swell the accounts of "*personal damages*" and "car repairs," on American Railways as that of "*telescoping;*" and, next in importance is "*oscillation*,"—which will be explained in the next article, and under that head—and the two together make up about three-fourths of all the disasters on our American roads, and both are being wholly prevented by the use of the "Miller Platform, Coupler and Buffer."

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I WILL MENTION A FEW CASES OF ACCIDENTS IN WHICH CARS WERE TELESCOPED FOR WANT OF THE PLATFORMS.

*First Case.*—On the 16th of May, 1870, a collision occurred on the Missouri & Pacific Railroad, near Eureka station, at 6 o'clock, A. M., between a freight and a passenger train. The cars of the passenger train were badly smashed to pieces, and a large number of passengers killed and wounded. A case of telescoping in its worst form. Immediately following this accident, the Company equipped their cars with the "Miller Platform," and since that time have had no accidents resulting in loss of life.

*Second Case.*—On the morning of the 8th of July, 1871, two passenger trains on the Newark & New York Railroad, met at Brill Switch, while running at high speed. The engines were demolished, the first and second cars of each train telescoped. Four persons were killed and nine wounded—nearly all that were in the cars. No injury to cars or of passengers could have occurred, had the cars been equipped with the "Miller Improvements."

*Third Case.*—On the night of September 8th, 1871, two passenger trains collided on the Louisville & Nashville Railroad, in which the cars telescoped, killing two and wounding a large number.

*Fourth Case.*—On the morning of February 7th, 1872, a southward bound passenger train on the Rockford, Rock Island & St. Louis Railroad, came in collision with a freight train going north near Upper Alton. The baggage car and first coach telescoped, took fire and were entirely consumed. Many of the passengers were caught between the car seats, and all egress from the car was cut off, while the flames finished the work of death. This case was another that largely swelled the number of "*killed and wounded by accident.*" A case which would not have resulted fatally had the cars been equipped with the Miller Platforms.

*Fifth Case.*—On the 4th of July, 1872, a westward bound train on the South Side (Long Island) Railroad, collided with a passenger train which was standing at Newtown Switch. The west bound train was heavily loaded with passengers, the platforms being full, and the engineer could not stop in time although he saw the flag sent to warn him, and did all in his power to avert the danger. The trains struck very lightly, and yet two cars were telescoped in the west bound train, and three in the other train. Quite a large number were

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killed and wounded, but such accidents can not occur there now as the cars of the Company are equipped with the "Trussed Platforms and Compression Buffers."

*Sixth Case.*—On the 6th of December, 1872, on the Pennsylvania Central Railroad, the eastward bound Cincinnati Express, which had been divided into two sections, collided, the second section running into the first, near Mifflin Station. This was a Pullman train, and as the second section rounded a curve the engineer saw the first section and put on the air-brake, but it failed to stop the train which plunged into the other section, telescoping two Pullman cars, killing and wounding a number of passengers. This is the only instance on record where Pullman cars have telescoped into each other, and this Company uses Pullman cars with the old fashioned platforms and slack couplings. Had these cars been equipped with the Miller Platform, as they were when they were first rolled from the shop where they were originally constructed, no such case of telescoping would have happened to them. Fortunately for the passengers of the second section, the speed was so much reduced by the brakes before the collision, as to save the cars of that section from telescoping, though the couplings between the baggage car and first coach were broken and the rear part of the section rebounded a short distance on the track where they became stationary. This accident shows the wisdom of using train brakes, and the certain result of neglecting to use the Miller Platforms.

*Seventh Case.*—On the evening of December 17th, 1872, a collision occurred between a freight and an emigrant train on the Central Railroad of New Jersey, near Bloomsbury, N. J. Thirty freight cars were broken up, the engine of the emigrant train wrecked, and two baggage cars immediately behind it were telescoped.

*Eighth Case.*—On the night of June 21st, 1872, an accident occurred on the Grand Trunk R. R. of Canada, near Belleville, Ont. The engine jumped the track; the cars were telescoped, and over sixty passengers killed or wounded. This was one of the most fearful cases of telescoping; one at which the heart recoils; which calls loudly for reform in the construction of passenger cars, and for providing them with the preventive of telescoping.

*Ninth Case.*—On the morning of the 27th of December, 1872, a mail train on the Baltimore and Ohio R. R. ran into the rear of an express train, telescoping the two rear passenger cars, which took fire and were burned. Three passengers were injured.

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# CASES OF PREVENTION.

I CONSIDER the preceding chapter on telescoping as quite sufficient to prove my theory, and now propose to show some similar cases of collisions and derailments where the Miller Platforms were in use, and how they preserved the lives of the passengers and the property of the companies using them. I shall show more cases of *prevention* of telescoping than I have of telescoping, as I am loath to republish the many disastrous cases that have come to my notice in the daily prints. What I have given is for the benefit of all concerned, and with the hope that it will aid in giving us a better and safer system of rapid transit.

*First Case.*—This was a collision on the Chicago, Burlington and Quincy R. R. in the month of May, 1869, between a passenger train and an engine running wild. The engines were demolished, but the cars kept their places, and no passengers were injured from the fact of the cars being equipped with the Miller Platforms and Compression Buffers, *vide* letter of Robert Harris, Esq., Gen. Supt. C. B. & Q. R. R.

GEN'L SUPERINTENDENT'S OFFICE,
CHICAGO, BURLINGTON AND QUINCY RAILROAD,
Chicago, Ill., May 8, 1869.

Col. E. MILLER, 231 Broadway, N. Y.,

*Dear Sir:* We just now have been unfortunate in having a collision on a curve between one of our passenger trains and a "wild engine," neither looking for the other, causing an utter wreck of both engines, but not materially damaging the cars or injuring any of the passengers—thanks to the Miller Platform. A few days ago there was a collision between two trains running in opposite directions on the Hannibal and St. Joe line, with similar results. Mr. Mead attributes their comparative freedom from loss to the platform, which we both regard as the best and most paying railway improvement extant.

Yours, truly,

ROBERT HARRIS, Gen'l Sup't.



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*Second Case.*—On the Erie Railway, between Cuba and Belvidere, May 15th, 1869, a passenger train, moving east, ran into a freight train, which had been thrown from the track, and though the concussion was very great, the passenger cars were uninjured and kept their places, saving the lives of all on board the train. It was the unanimous opinion of those in charge of the train, the passengers, and officers of the road, also of Gen. Sup't Riddle, that had it not been for the Miller Platforms, the cars would have telescoped with the most fatal consequences.

*Third Case.*—In the month of July, 1869, the Washington through express train on the Camden and Amboy R. R., was thrown from the track by running into a "dumpy." "The cars ran some distance over the ties, but the couplings held each car in its place, kept the train from breaking up, prevented the cars telescoping, and saved the passengers from injury. This was owing, it is said, to the cars being provided with '*somebody's patent bumpers.*'" So said the *New York Sun*, in describing the accident. These "bumpers" were the "Miller Platforms and Buffers." The following is what Mr. Sup't Geo. W. Barker said about it:

NEW JERSEY RAILROAD AND TRANSPORTATION CO.,
OFFICE OF MASTER OF TRANSPORTATION,
Jersey City, Sept. 4th, 1869.

CO.. E. MILLER.,

*Dear Sir:* In reply to your note of this morning am happy to certify to you that, in my opinion, the use of your "Compression Buffers" on our express train, prevented train and passengers from receiving serious injury in a recent accident occasioned by the engine striking an obstruction on the track, overturning the postal and baggage car, but causing *very little* injury to the other portion of the train.

Yours, respectfully,
GEO: W. BARKER,
Master of Transportation.

I concur in the opinion of Mr. Barker as above given.
F. WOLCOTT JACKSON, Gen'l Sup't.

*Fourth Case.*—This occurred on the Allegheny Valley Railroad, in May, 1870. An express train from Oil City for Pittsburgh, struck a large rock at a land slide. It was stated that the engineer had no knowledge of the obstruction until the engine, which was running very fast to make up lost time, struck the rock. The Pittsburg

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*Commercial*, in referring to the accident, contained the following: "The speed of the train is at its highest rate; the impenetrable obstruction on the track is not seen until so near that no effort can be made to check the momentum of the train, and the advance of that train is stopped *instantly*—not in one hundred feet, nor fifty feet, but *instantaneously*. Could any severer test than this be given to these improvements? (Miller Platforms.) It was this same peculiar improvement that saved the lives of the passengers of that train."

*Fifth Case.*—This case is explained in the following correspondence:

231 Broadway, New York,
July 26, 1870.

H. E. Sargent, Esq.,

Sup't Michigan Central Railroad, Chicago, Ill.

Dear Sir:—I see in this morning's New York *Herald* a report of an accident on your road on the 20th inst. The report seems to be copied from the Detroit *Free Press*.

While I deeply regret the loss of life on that occasion, I feel a little anxiety to know how the Platforms behaved. The collision seems to have been sufficiently severe to have caused a serious case of "telescoping," if the cars had been equipped with the old style of platforms. Were all the cars equipped with my platforms, and did any break? Please answer and oblige,

Your friend, E. MILLER.

Office Michigan Central Railroad,
Chicago, July 30, 1870.

E. Miller, Esq., 231 Broadway, New York:

Dear Sir:—I am in receipt of your favor of the 26th inst., and cheerfully comply with your request as to particulars touching the late collision upon this road at Wayne Station, and the operation of your platforms as connected with the same.

The passenger train was our "Atlantic Express," which leaves here at 5.15 P.M. On approaching Wayne Station—which is not a stopping place for this train—the train was signaled to proceed, and did so without slacking its speed, running in upon a side track and into the rear of a freight train, demolishing the conductor's car and killing two brakemen, who were supposed to have been asleep in the same. The momentum of the train drove the engine forward, demolishing several freight cars, when it finally stopped after trimming the

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engine pretty thoroughly, and to some extent damaging the baggage car. The second class car received a small bruise upon one corner; but none of the passenger coaches, which immediately followed, nor the three sleeping cars on the rear of the train, were IN ANY MANNER bruised nor injured; nor was a passenger on the train injured!

The passenger train was composed of a large 12-wheel baggage car, one 12-wheel second class car, two 12-wheel first class coaches, and two 12-wheel Pullman Sleeping Cars—all of which had the Miller Platform. On the rear was the heavy 16-wheel Pullman Hotel Car, which had the ordinary platform.

I was informed by one of the Sleeping Car conductors, that the easing up of the train was so gradual, and the jarring so slight, that it did not awaken more than half his passengers.

It is the opinion of all our people who were present, and with whom I have conversed, that the Miller Platform and extraordinary strength of our cars prevented much damage, and possibly personal injury and loss of life upon the train. Truly yours,

H. E. SARGENT, *Gen'l Supt.*

*Sixth Case.*—In February, 1871, a passenger train on the Northern (N. H.) R. R., ran into the rear of a freight train at North Boscawen, knocking the freight cars and passenger engine into "pi," but resulting in no damage to the passenger cars nor their occupants. The passenger cars belonged to the Vermont Central Railroad, and being equipped with the platforms, they were saved from telescoping.

*Seventh Case.*—We copy from the New York *Herald* of January 10th, 1872: "Owing to a misplaced switch on the Hudson River Railroad, the four o'clock train from New York yesterday afternoon, ran off the track just south of Hastings. Six passenger cars, two palace cars and a baggage car were dislodged and ploughed their way over the frozen ground at a fearful rate. Not one of them upset, and when they came to a stand they formed a zig zag line, but all coupled together. The passengers were panic stricken, but no one was injured in the least."

*Eighth Case.*—On the Boston and Providence Railroad, on the afternoon of the 15th of July, 1872, the express train from Boston, while passing through East Foxborough, struck a butcher's wagon, throwing it around in such a manner as to bring it under the wheels of the train, derailing the cars, which ran a considerable distance over the ties, breaking the trucks and rolling them together beneath the



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car bodies, and yet, when the train came to a standstill, it was found that not a person was injured on the train. The passengers were loud in praise of the Miller Platforms, to the use of which they accredited their escape from imminent peril. The managers of the road claimed that the platforms in that one accident saved to the company double their cost.

*Ninth Case.*—On the Chicago and Northwestern Railway, Aug. 17, 1872, a passenger train going south, when near Clinton Junction, was thrown from the track by the engine climbing the rail on a curve, shaking up the passengers in a fearful manner as the cars jolted along over the corduroy of the ties. They were all equipped with the Miller Platforms, which prevented telescoping and injury to passengers and cars, that would surely have happened had the cars been supplied with the old style of platforms and slack couplings.

*Tenth Case.*—Nov. 30, 1872, on the Boston and Providence, Railroad, the express train which left Providence at 3 o'clock, P. M., when going into Boston, ran into the rear end of a freight train that had broken in two, on a curve near the Coliseum. The engine of the express was the A. A. Folsom, run by Mr. Wm. Bowman, who did all in his power to avert the disaster, but it being on a blind curve, he did not see the freight train until it was too late. The concussion was very heavy; five of the freight cars were smashed and the beautiful engine badly damaged. However, there were no persons injured on the passenger cars, which was conceded to be owing to the Miller Platforms, nor were the cars much damaged. The managers of the road were highly pleased with the effect of the platforms, and claimed that in this one case they again saved more than the cost of the equipment of the road.

*Eleventh Case.*—On the night of Nov. 29th, 1872, on the New York Central, the Cincinnati express, going east, ran into the rear of a stock train which had stopped and just started at a water-house near Chittenango. The express was going at the rate of forty miles per hour, and dashing into the stock train, ran nearly through five cars, when it left the track and went through the water-house, throwing it down. The express brought up within the length of seven cars, and yet not a person was injured, nor were the cars broken, but the engine and tender were complete wrecks, the latter being smashed by the platform of the mail coach, which was in front of the other cars.

*Twelfth Case.*—At Concord, N. H., on the Montreal road, Dec. 30, 1872, the 3.30 southward bound express, loaded with passengers, was saved by the Miller Platforms, from being "pulverized."

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*Thirteenth Case.*—About the same time the mail train on the Rutland (Vt.) Road, when near Cuttingsville, ran off the track from striking a bad frog, and though running fast at the time, the cars were but slightly injured, and no persons hurt. The Rutland *Herald* says: "If it had not been for the Miller Platforms and couplings a serious smash-up might have occurred."

*Fourteenth Case.*—On the morning of December 13th, 1872, near Basket Station, a man got fast with a log on the Erie railway track. He unhitched his horses from the sleigh and signaled an approaching express, but too late to stop it, and it struck the log with tremendous force, throwing it from the track at the same time the engine went off, ran over a short bridge on the ties, and into the ditch—all without injury to the passengers or cars, though the engine was badly wrecked. "The tender and cars were all equipped with the Miller Platforms."

*Fifteenth Case.*—On the 27th of September, 1872, the Chicago express train on the Hudson River Railroad, ran off the track at Yonkers. Six cars, filled with passengers, left the track, but none of them upset, nor was any one injured. "*They* were equipped with Miller Platforms."

*Sixteenth Case.*—On the night of Dec. 26th, 1872, five coaches of an east-bound passenger train on the New York Central were thrown from the track by the breaking of a switch-bar, between Schenectady and Albany. They came to a standstill in a zig zag line across the three tracks, but not one turned over or uncoupled, nor was any person hurt. "*They* use the Miller Platform on all their cars."

*Seventeenth Case.*—On the Fitchburg Railroad, January 10th, 1873, by a misplaced switch, the afternoon train, going east, at Waltham run into a freight train and smashed both engines badly, but did no injury to passengers or cars; "the latter being equipped with the Miller platforms which saved the train."

*Eighteenth Case.*—The St. Louis *Railway Register*, of January 24th, 1873, contained the following: "A broken rail threw a train off the track on the Hannibal and St. Joseph Railway last week. All accounts agree in stating that the Miller Platform prevented telescoping and immense loss of life and property."

*Nineteenth Case.*—At about 2 o'clock on the morning of February 10th, 1873, the second Pacific express train, on the Hudson River

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road, ran off a turned switch at Coxsackie while running at the rate of thirty miles per hour. The trucks of the cars were torn away and demolished, but the car bodies were uninjured and not a person was hurt on the train. It was freely expressed by the passengers and railway employés, that had it not been for the "Miller Platforms," the cars would have telescoped and the loss of life would have been frightful.

Having furnished in the foregoing what I deem as ample evidence of the value of my improvements, I will give, in some other part of the book under its appropriate heading, a few of the many testimonials which I have received from managers and superintendents who are using my Platforms on their cars, and who, from actual experience, know their great value.

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# UNEXPLAINED ACCIDENTS

AND

# OSCILLATION.

In the monthly report of accidents there is always found a large per centage which are denominated "unexplained," and it often proves that this class of accidents is of the most disastrous character, being very destructive of both life and property. For the sake of bringing this subject before the reader, I propose to give a detail of accidents of this character, taking them from the published accounts of the daily press, stating the causes assigned and following with what I consider the real defects which led to them. In doing so, I will endeavor not to criminate or censure the management of railway officials —as all are my friends and a bond of common brotherhood binds me to them—but I will aim to show some of the radical defects of the old system of making up trains and its deleterious effects upon tracks and rolling stock, leading directly to danger and accident. The daily papers are too ready and willing to jump at conclusions, and it is often the case that the innocent are made to suffer for the guilty—either through a lack of knowledge regarding the subject of railways, or from a wilful desire to bring reproach upon the management of certain roads.

On the first of February, 1872, an accident occurred on the Lehigh Valley R. R., which some of the New York papers described under the following caption:

"The Broken Rail Accident.
Details of the Disaster on the Lehigh Valley Railroad.
Seven Persons already Dead and Dying.
Nineteen Passengers Reported as Wounded.
Culpable Recklessness of the Road Engineers.
Racing on Short Curves Repeatedly Indulged In.
Necessity of More Stringent Rules Against High Speed."

The first four lines of the above heading may be true; but the balance of the caption—the 5th, 6th and 7th lines—shows the limited



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knowledge of the man who made it up, and of the reporter who furnished the copy: to say that he wrote an account of the occurrence, would be doing him injustice, for it is too full of errors, and certainly he did not mean it should be; therefore I am inclined to the belief that it was not so written. The article in question was full of critical wrath toward the engineers, charging them with running at too great speed, and claiming that cars ought never to be run over thirty miles per hour. Now I hold that fifty miles per hour is not too fast, providing the cars are built as they should be, and I see no reason why this may not yet become the standard for the average speed of express and through mail trains on all trunk lines. "Recklessness of Engineers," or "Racing on Short Curves," did not contribute to this accident. Nor did weak or unsound rails or ties, for no company can boast of better. The real cause of the accident should be understood by every railroad president, vice-president and superintendent, as well as their master mechanics, car builders and engineers, for it is these officers who accept or reject propositions for the use of important improvements to make the rolling-stock of their roads the most perfect in use. It is to these officers that I address this subject, and I ask them to read it—all of it—carefully and studiously, for I assure them that, before they finish it, they will clearly comprehend how this accident was produced and how it ought to have been prevented, and they will understand the cause of many accidents which have heretofore been misunderstood, and see instances, perhaps, where they and the public have wrongly judged of their employé's and those of other companies. They will see how that thousands of lives have been lost, and how it is that railroads which, a few years since, were deemed dangerous on account of just such *broken rail* accidents having become alarmingly frequent, are now—with the same management and the same rails and ties—free from fatal accidents, though they use heavier coaches and run their trains at greater speed. They will also see unfolded to them the true theory of making roads pay by curtailing the expense of car and engine repairs, and the more expensive cost of litigation and damage to persons.

The cause of that accident was SLACK COUPLINGS, which, at high speed, are always productive of oscillation. On all roads in all countries where this matter is understood, broken-rail accidents are made to depend on the condition of the rails, while on many roads in this country (not Europe) it depends on the way in which car platforms are constructed, and the manner in which trains are made up. We can run trains as fast and with as much safety in this country as they do in England, and even with greater safety at a corresponding high

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rate of speed, and this we already do, on more than 200 roads, with no oscillation or telescoping of cars. We can and ought to do it on all our roads, and will do it when this matter is well and clearly understood. I have wrought industriously for many years to make my railroad friends understand the importance and necessity of so constructing our car platforms and couplings, as to take the contact between the cars, in the line of the greatest resisting power (straight line), to prevent TELESCOPING; and I sought at the same time, without calling particular attention to it in all cases, to prevent OSCILLATION, and I am proud to say that considerably over 200 of the best roads in this country now have their cars equipped as they should be, and are free from accidents of the character named above, and they have not found these improvements expensive, but highly profitable to all concerned. All this I have done without alarming the public in the least, or acquainting them with the indisputable fact (I have not yet found a person who attempts to deny it) that no man can invent a more ingenious or successful contrivance to ensure the destruction of cars and passengers, in cases of collisions and derailments, and more certain to break rails by oscillation, and at the same time keep the public in ignorance of the real cause of it, than the low platforms and slack couplings in cars running at high speed, particularly on down grades.

These low platforms and loose couplings are the old, simple primitive, make-shift things that "*cost but little,*" and were thought good enough and safe at the speed, weight of cars, and length of trains used when they were first conceived, *i. e.*, forty years ago; but on the trains of the present day, they are absolutely dangerous, and unquestionably so at a speed of twenty miles per hour.

The system I complain of is found in use only in this country; it was abandoned long ago in every other but ours. "Slack couplings," with high speed, are the cause of all "broken rail accidents," in which the engine is reported to have escaped and remained upon the track. The jarring and jerking felt on the engine or cars next to it, which remain on the track, is caused by the cars off the track, and not by breaking rails under the wheels of the engine, as many are led to suppose. Occasionally I find an article in the newspapers, bearing evidence of having been written by a person who has devoted a portion of his time to the study of this subject. Such an article I find in the Whitestone *Herald* of January 24th, 1872. Other articles, equally as correct, I find in various newspapers, which shows that this subject is receiving the attention of the public. Would it not be well for railroad officials to be a little in advance of the public in this matter?

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## OSCILLATION.

Oscillation will do more than break rails; it will often cause derailment without breaking the rails or the wheels, or any thing appertaining to the track or car. It may be claimed that such cases are rare, but I will show you they are quite possible with slack couplings and high speed. You may ask: "Do not the flanges of the wheels keep the cars on the rails while the latter remain sound?" Sometimes they do not! The "tread" of the wheel is "coned," so that the axle of a pair of wheels may pass round a curve on the radius line. This coning of the wheels inclines them to seek equalized circumferences, and even on a straight line causes the truck to run in a serpentine course, floating from side to side, frequently *impinging the rail* with the *leading wheel*, so that only *one* wheel has to be forced through, upon or over the rail, to produce an accident by oscillation; and as the *flange* does not present a *vertical* face or line to the rail, but, instead of it, one that slopes at an angle of from thirty to thirty-five degrees from a vertical line, *it is* but *an inclined plane* that would take a lateral force equal to the vertical pressure upon it to cause it, when revolving, to *worm* itself on and over the rail,—provided the rail does not break or spread,—for, though the plane is not quite octant, the friction, by impingement of a dry rail by the wheel in a lateral thrust, more than makes up the deficiency in that particular; because the sloping flange of a revolving wheel, operated upon by sufficient lateral pressure, is made to involve two great mechanical powers, to wit: the screw and the wedge—the face of the flange being an inclined plane under revolution. In first-class cars there is a vertical pressure, we will suppose, of about two tons on each wheel; then, about two tons lateral pressure, on the "leaders" of a truck, may be sufficient to cause derailment. Hence, when a train, running under the conditions above named, has attained a high degree of oscillation, it becomes only necessary to *abruptly* check the momentum of it, at its forward end (thus giving an additional force to the oscillation at the critical moment), to cause a derailment; hence accidents of this character most frequently occur when trains are approaching a stopping place or station, crossing or bridge (and this latter is almost always on *down grades*, where, owing to great slack in the couplings, oscillation is most violent); also on sharp curves, or wherever it is desired to *check the speed* of the train, and sometimes it is done by accident, as by collision, etc. I would pursue this theme farther and call your attention to another peculiarity of the action of trucks and wheels when under rapid motion. The coning of the wheels as they

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swing from side to side, enlarges the circumference of the wheel on the line of contact with the rail on one wheel while it diminishes it on the other. This causes the one of lesser diameter to slip in order to keep with the other, and results in sliding outward, as is perfectly natural, at the same time producing a slight drawback on the momentum of the train. These little drawbacks on every axle of a long train, combined together, are equal to a certain amount of brake power, and explains why, as many engineers have found by experience, that a train sometimes starts harder than at other times, owing to the position of each and every car upon the rail. Again, it is a fact that in cases of sudden check upon the forward end of a train, which is increased in force as it passes from car to car, where slack couplings are used, will strike the bodies so heavy as to cause the forward trucks to tip backward (as there is no fore and aft bearings), and thus the weight on the leaders is often lifted and sometimes the leaders themselves. This is a fact vouched for by some of the best and most experienced railway employés. This, however, can be overcome by using six wheel trucks.

A few cases (of accidents), as examples, will help us to understand this matter. I get the following from the newspapers:

*First Case.*—Indiana Central, Jan. 18, 1865: "the train was *running very fast*, and *encountered a sharp curve*, the engineer *shut off*, the *rear car was precipitated over sound rails*, and down a bank, turning over four times." Wounded forty.

*Second Case.*—Almost identical with the first. On the Galena & Chicago R. R., near Cherry Valley Station, running at high speed, shut off on nearing station; FIVE cars were thrown over sound rails, and down a fifty feet bank, &c. "Many persons injured, &c.

*Third Case.*—The same as the 1st and 2nd, occurred on the Northern Central Railroad, January 19, 1865.

*Fourth Case.*—On the New York Central Railroad, June 17th, 1865. "The train, running on a straight and smooth track, was checked, by shutting off steam, near Oneida Station; and the two rear cars thrown over the rails, and down a small bank. The rails remained undamaged."

*Fifth Case.*—On Pennsylvania Central Railroad, Feb. 3rd, 1865. "The express train going west, and running very fast, at 5 P. M. the engine broke her connecting rod, near the forward crank; the rod dropped on the track and ran into the ground, nearly upsetting the

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engine, and causing a check to the momentum of the train which threw the three last cars over sound rails, and down the bank; killing two and wounding fourteen."

*Sixth Case.*—On the Buffalo & Erie Railroad, on the 18th of December, 1867, the train was behind time and running fast to make up time; it ran down the grade with unusual speed; the engineer shut off at the bridge over Big Sister Creek, near Angola, thus giving a slight check to the forward end of the train; the two rear cars were thrown over sound rails and off the bridge. Killed, 48; wounded, 40.

*Seventh Case.*—This occurred on the Buffalo & Erie Railroad, near Westfield, N. Y., in the month of February, 1869. The through Express from Chicago, was running rapidly down a grade, the oscillation becoming so great that the two rear cars were thrown off, and down an enbankment about 8 feet in height. Not a rail was broken or damaged, and fortunately no persons were killed, though several were severely injured. The New York *Herald*, in commenting on this accident, said: "There was no doubt in the minds of the officials, on arriving at the scene of disaster, that it was owing to slack couplings, and only another warning against a system that should be abolished on all roads, to be superseded by compression buffers."

*Eighth Case.*—On the Chesapeake & Ohio Railroad, on the 6th of August, 1870. The train, in passing up a steep grade and around a sharp curve, having the principal engine in front, drawing the train, and a "pusher" engine at the rear end of train to help. The head engine kept the front of the train straightened out, and a degree of tension in all the couplings between the cars, but broke loose from the train when the cars sagged back on the pusher, producing a check, which, owing to the consequent great oscillation, or lateral thrust, threw the cars over the outer rail, killing 9, and wounding 15.

*Ninth Case.*—On the 24th of December, 1872, on the Buffalo, Corry & Pittsburgh Railroad, a train, consisting of a baggage and two passenger cars, was approaching Prospect Station from the south; the train was running at high rate of speed, and when about to cross the bridge over Goose Creek, the engineer shut off; the oscillation was very great, and the entire train (except the engine and tender) went off the bridge into the chasm, where it took fire, and only a very few of the passengers escaped. It was found that the flange of one of the rear wheels of the tender was broken, letting the truck down on the track, and checking the train; and yet the engine passed over in safety.

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*Tenth Case.*—This happened on the Wilmington & Weldon Railroad, Sept. 26, 1872, while an express train was passing a bridge. The engineer shut off, and the two rear cars went over into the stream. No cause was assigned, but the report said it was supposed to be owing to a broken rail.

*Eleventh Case.*—On the 8th of January, 1873, on the Louisville & Nashville Railroad, an express train was approaching Belmont Station, when suddenly the two rear cars were thrown from the rails, and drawn some distance on the ties, when one turned over and took fire from the stoves. The accident occurred on a straight track, and there being no embankment, there were but few persons injured. It was said to have been caused by a broken rail.

These cases I deem sufficient. Do they not show the unavoidable effect of the oscillation of the cars under the conditions I have named?

Now, methinks, I hear the question: How is oscillation prevented? I answer, simply by tension or compression.

First.—Tension, by resisting, at the rear end of the train, the power and effort of the engine at the front end thereof—by the use of the brake on the rear car—so that there may be no slack in the train; and—Secondly—by Compression on the elastic buffers between the cars, as practiced in England, France, and all other parts of Europe, by machinery applicable to *their* roads, but not to *ours;* or by the same principles embodied in the "*Miller Compression Buffer and Coupler*," used with the "Miller Platform," which performs well on American roads, and has not, in a single instance, failed to do its work surely, safely, profitably, and in every respect satisfactorily.

The first plan—braking on the rear car—cannot for a moment be entertained; while the latter—*tension* by *compression* between the cars—is free from objections.

In all parts of Europe, where railroad trains are coupled with compression, there are no accidents by oscillation, or telescoping. In America, where it is omitted in coupling cars such accidents are of frequent occurrence.

Hundreds of lives and millions of dollars of property have been destroyed in the passenger department of American railroads, and most of them by telescoping and oscillation, which can and must be prevented.

In conclusion. Cars are sometimes forced *over* the rails by oscillation as I have shown; broken rails also are caused by

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"oscillation." When you hear of a broken rail accident, are you not almost always told that one, two or three of the rear cars (sometimes more, if the train is a large one,) ran off, while the engine and some of the forward cars remained upon the track. Why is this? Because oscillation commences at the first car and increases in each succeeding one until it reaches the last, where at high speed, occurs the most severe impingement of the rails. But I have said enough! Do not lay this matter aside until you fully comprehend it—study it—write to me for any information you may want, it will be gladly and freely given to all Railroad men. Send for the shop plans and patterns, the former will be supplied gratuitously, the latter at cost. Hooks, Buffers, and Levers, ready made, will be supplied on short notice.

## DAMAGE TO CARS AND ANNOYANCE AND DAMAGE TO PASSENGERS BY JERKING—UNDER THE OLD STYLE OF SLACK COUPLINGS—EXPLAINING HOW THE THING IS DONE.

1st. Backing.—In the old style couplings there is an interval usually of about four inches between draw-heads. This enables the engine, which is of twenty-five or thirty-five tons weight, perhaps, to move back that distance before it meets with resistance. The power used to move the engine, together with this momentum, overcomes the spring at the back of the draw-head of the first car, and causes a solid blow of the engine on the first car which jars the first car—the engine still moving, has, besides its own weight and momentum, that also of the first car, and also the power of the (said) first compressed spring which reacts, and meeting with no resistance between the first and second cars, in consequence of the interval between those cars, the second is struck with a heavier blow than the first, even though the engine be moving no faster, and so on to the last car, which receives a much heavier blow than the first car, though the engine may move no faster than at first. All this, understand, occurs in backing the engine.

2d. Starting Ahead.—The effect in *starting ahead* is the same; the moving engine "catches" the first car, reduces the spring, which reacts, dragging the car up again towards the engine, catching the second car with a jerk, with the same effect as before, and so on to the last, the last car receiving the hardest jerk; so that the effect is the same in backing or starting—the last car receives the severest jerk. This explains the cause of the very disagreeable movement of the cars in starting from or stopping at stations, as is everywhere

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experienced, much to the annoyance and often *damage* to passengers, where the old style of slack couplings are in use.

For fear that railroad managers, who have never tried the Compressed Couplings and who are *accustomed* to the incessant "jerks" and "jars" in starting and stopping trains on their roads, may not give due consideration to the above, I will add,—"*Tight Couplings*" make each car worth at least $1,000 more—than if Slack Couplings were used—to the company by diminishing the wear and tear, and consequently "*annual repair account.*" Again: Passengers are not only annoyed and vexed but absolutely maimed or lamed for life by the jerks of the—*infernal*, because dangerous and unnecessary—loose couplings.

After the above was prepared the following case was found reported in the New York *Herald* of April 10, 1873. It is of so recent date that I adopt it in place of others I had selected.

## AN INJURED PASSENGER OBTAINS $8,000 DAMAGES IN TRENTON.

For the last three days the United States Circuit Court at Trenton has been engaged in hearing a suit for damages brought by Jerome B. Pollard and wife against the Pennsylvania Railroad Company for personal injury done to Mrs. Pollard while in the cars of the defendants at Jersey City in the summer of 1871. The plaintiffs are residents of Chicago. At the time of the accident Mrs. Pollard had been on her way from that city to New York. The train upon which she was traveling was near the depot at Jersey City, running at a slow rate, while the lady was standing in the car near her seat, and, when in the act of arranging her daughter's hair, preparatory to leaving the train, a sudden and violent jerk was given to the car, which caused her to fall against the end of the seat, striking her in the spinal joint. The result was a serious injury, from which she still suffers. The sum of $20,000 were claimed as damages. Mrs. Pollard's depositions were taken in Chicago and read in Court, as she could not put in a personal appearance. Messrs. Abbott, of New York, and Mr. W. Creveling, of Trenton, acted as her counsel, while Mr. J. W. Scudder conducted the case on behalf of the railroad company. Judge Nixon proceeded to charge the jury yesterday at half-past two o'clock. The jury retired, and after being out five hours brought in a verdict for the plaintiff, $8,000 damages.

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# INQUIRIES, OBJECTIONS, AND EXCUSES.

I am indebted to friends for letters of inquiry, and I hope I may receive many more. I have also received some objections and excuses, of the former only three, and of the latter one, and I think it may be well on this occasion to mention them and repeat my answer to them. Before doing so, let me here invite all who take an interest in railroads to give my "improvements" the sharpest kind of criticisms, for if they have faults I shall be glad to know it! All letters will receive my prompt personal attention.

We will now take up the important question, the three objections, and the excuse.

1st. "Will the cars uncouple accidentally?"

2d. "They are too heavy."

3d. "You charge too high for the right!"

4th. "We run our cars over *other roads;* when *they* adopt the improvements, then we will also!"

5th. "Cars equipped with compression, or without slack, start hard and are bad in snow storms!"

The 1st is a question that is frequently asked.

The 2d, 3d, and 4th are offered sometimes as *objections.*

And the 5th is an excuse for not *immediately* adopting the improvements.

I will consider them briefly, in the order in which I have named them.

1st. "Will the cars uncouple accidentally?"

Answer. They will not, excepting one of the cars is upset or turned on its side, in which case the hooks are turned *back* or *side,* to face, which renders them useless as couplers. But while both coupled cars stand up, whether they are on the track or not (no matter how much they may lean, if neither of them falls over) it is impossible for them to uncouple; because the head of the hook is 6 inches, vertical measurement, by 8 inches, lateral, while the spaces through which



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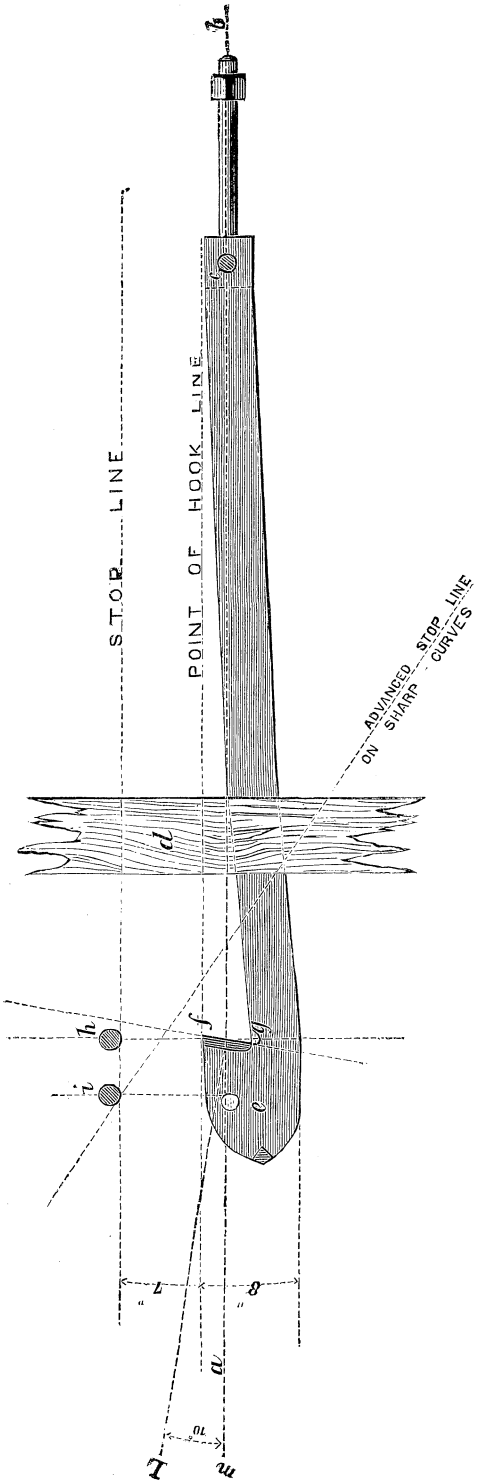


PLATE III.

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they would have to pass, in order to uncouple accidentally, are just one inch less each way, and 6 inches of solid iron is not easily passed through a 5 inch space, in iron, or 8 inches through 7 inches. But these couplers, like everything else, may be, by severe accident, broken—though they are very much stronger than any other—or bent so badly as to change the acute angle of the hook to an obtuse angle, or the same effect may be produced by a leading car running off the track and turning round to a line of deflection so great as to break either the stop or the hook; in either event the cars may be separated; but while on the track, they never can uncouple accidentally.

That this point may be made clearer, I will attempt to explain the philosophy of the construction of this plan of coupling cars. In the diagram of the coupling hook and stop (on the opposite page), the line marked *a*, *b* is the longitudinal center line of the car, which, for convenience, I will call the "draft-line;" *b* is the rear end of the coupling hook; *c* the joint; *d* the stirrup, or "yoke" of the hook; *g* the back of the hook; *f* the point of the hook, and *f*, *g* the face of the hook. The line of the *face*, you will perceive, is *not rectangular* to the "draft line" *a*, *b*, but acute-angular thereto. The exact value of this angle is obtained in this way, viz.: The usual curvature of rails is from 0° to 10°. It is desirable, for the sake of convenience in uncoupling cars, to make this acute angle as slight as possible, and yet not so obtuse to the line of draft of the next car, L, when on a curve, as to cause or permit uncoupling. So I take 10°, *m* to L, as the maximum, and draw said "*face-line*" at right angles with said line of draft, L, of said annexed car on said maximum curve, and call this my *standard* "face-line," though there are occasionally sharper curves to traverse.

The "stop," *h*, forms an equally important part in the plan of making an automatic and safe coupling. The point marked *i* is another locality for the same stop. This is set just far enough from the point of the hook, to leave a space exactly one inch less than the width of the hook head—the former 7, the latter 8 inches. Through this space each hook must pass in coupling, the space being enlarged, for that purpose, by the pressure of the beveled sides of the hooks, in the act of closing together for the purpose of coupling, and when the coupling is completed, (the springs having crowded the hooks together), the space is restored to 7 inches.

In equipping cars for use on *extra sharp curves*, all I have to do to render the coupling safe, is to advance the stop towards the front, *i. e.* towards the other car. To show plainly what this change of location

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of the "stop" *h* will do, I have located it at *i*; while the location of the "stop" at *h* permitted the cars to move on curves without materially diminishing the space between the point of the hook *f* and the stop *h* its removal to *i* causes, as shown by the line—which I call the advanced stop-line—a reduction of that space about one-half, or to $3\frac{1}{2}$ inches.

Of course, the diagram shows an exaggerated plan, but I do this to make the theory plain. For a curve of 100 feet radius, I advance the stop $1\frac{1}{2}$ inches. This, I find by experience, is sufficient, and it does not materially interfere with uncoupling on lines on ordinary curves. So you see the question of reliability on sharp curves is settled, theoretically and practically.

2d. "They are too heavy!"

ANSWER. This is a mistake; they may be made, and should be, *exactly* of the right weight to withstand a collision of a full train of cars at maximum speed, or a blow from an engine and train in motion, and at usual speed, on the rear platform of the rear car of a standing train, without breaking the platforms or cars or injuring the passengers or employés. They are heavier than some, and much lighter than other platforms, and they are graduated in weight to the service required, and should be lighter on *light* than on *heavy* trains. Platforms, like the roadway and the wheels, axles, trucks, and sills or floors of cars, require to be made strong, consequently a certain amount of weight is indispensable, but all other parts of the cars should be made as light as possible.

3d. "You charge too high for the right!"

ANSWER. I certainly do not intend to do so! Nearly eight years ago, I offered "rights" at nominal prices to those who would adopt the improvements, and put them in use *at that time*, and thus aid me in the early introduction of them. Several companies accepted the offer, and have used them ever since. They have found them profitable, and quite indispensable. At the same time it was my often expressed intention to fix the price of "rights" at one hundred dollars per (passenger train) car, *and make no charge for future equipment.* I did so; but, as I heard complaints against these charges, and *as I desired to meet the views of all* as nearly as possible, I took great pains to ascertain and compare the views of railroad managers, and particularly of the officers and members of the Eastern and Western Railroad Associations, upon this subject, and the result was the trial

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of a *Price List* that I was assured would *give general satisfaction.* I charge, one-half of what I thought, and still think, I ought to get; but I will be content if "*low charges will hasten the introduction of the improvements on all American railroads,*" and thus speedily render travel safer and more comfortable. My friends kindly predict that I "*will make a fortune out of it!*" I know that I am working hard, and rendering valuable services to the *world*, and *deserve* for myself and family *one* (small) "fortune" out of the *many* I am gaining for others.

4th. "We run our cars over other roads; when they adopt the improvements, then we will also!"

ANSWER. There is no *necessity* for waiting for other roads to adopt them! As well might you say, "We will not change ONE of *our cars* until all the others (of our cars) are changed!!" The rolling stock of the whole country, cannot be changed in an instant! It is just as well, *in all respects*, to mix your cars *that are equipped* with those of other roads *that are not equipped*, as with your own cars that are not equipped! All roads that have adopted them have mixed up their own cars in their everyday service, and also *their* cars with those of other roads, some equipped and others not, and have experienced no inconvenience therefrom.

5th. "Cars coupled with compression or without slack, start hard, and are bad in snow storms."

ANSWER. In the outset, I too being accustomed to slack couplings—was prejudiced against compression, for the reason mentioned, but it required but little reflection to convince me, that even if this apparent objection did exist, it was *far overbalanced* by the great and vital importance of *compression as a means of saving life and property!* And when I reflect upon the *universal practice in Europe* of *coupling cars by compression*, I began to have faith in its utility on American roads; since that time, years of experience have adduced positive proof of its great value, and that it is not only entirely free from this objection, but it aids, the engine in starting the train when properly handled—as is explained in the following, regarding the subject of

## STARTING TRAINS.

IT has been suggested by the operators of some roads, who are not familiar with the workings of the improvements, that tight coupled trains start hard.

In reply I will make brief mention of the subject of starting trains

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which I hope all may comprehend. The true principle of "getting a start," may be gleaned from the engineers' saying: "All we want is a 'turn,'" (of the driving wheels). Now, what use is the "turn"? Does it aid in starting, by giving additional power to the engine? No! not exactly; but it does by the *momentum and weight* of the moving engine. Then all that is needed is to overcome the inertia of the driving wheels and get momentum to aid the steam power, and this is true, for the locomotive, though considered a powerful piece of mechanism, is comparatively a weak vessel without the aid of momentum. With compression buffers not only can the momentum of the engine be brought to bear upon the train, but each car will be found to possess a certain amount of reaction, which, when properly applied, will act directly upon the engine, and add greatly to its power and force, doubly more than what is taken from it by the loss of slack couplings. For instance; a train, say of ten cars, is "stalled" going up a 70 feet grade, to start it again let the wide-awake brakeman set the brake on the front platform of the rear car, or two rear cars if necessary, then start the engine ahead so as to draw out the hooks as much as possible, then reverse and throw the power and weight of the engine backward upon the train, pushing the forward cars upon the rear car or cars, and compressing the buffer-springs, with $1\frac{1}{2}$ inches play in each buffer (equal to three inches between each pair of cars,) you will have a compression of 30 inches. Now reverse again and start ahead, and as the rebound of the springs—which comes of the release of the pressure of the engine—reaches the rear car, the brakeman who holds the brake-wheel will let go, and the entire train will be in motion, and that too with less loss of time than by the old slack method. Thus you will find that your engine has a power of her own creating and equal to herself *behind her*, which, when properly used, is double the value of slack couplings in starting trains, from the simple fact that the buffer-springs will bear a compression of *ten to eleven tons* each, and this made to act upon the engine, must and does certainly aid it greatly in starting a train.

I have the testimony of more than one hundred engineers, who, before they tried them, were not in favor of compression buffers, and who—after trying them—claim that they have *no trouble in starting* their *trains*,—that they can start the heaviest trains with as much ease as they ever did with the slack couplings. The most experienced of these engineers assert that they can start more cars, with a brakeman who understands his part of the work, than they can of the old style, slack couplings.

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# A FEW SUGGESTIONS TO MASTER CAR BUILDERS.

I HAVE endeavored, in this pamphlet, to explain in a concise manner the effective working of my improvements, but have said nothing in regard to their construction. I had hoped to have been able to insert a full set of tracings, with directions for equipping, but find the pages too small to admit them; and, therefore, will offer some few suggestions regarding their application to cars, and at the same time, call attention to errors which have arisen, by copying from the work of others, and a want of thorough knowledge of them, which can only be gained correctly by studying well the tracings and printed directions, which I furnish, or aim to furnish, to all railway managers and master car builders. One great error which is often met with, is that of placing the hook too low, so that a greater space than five inches is had between the lower side of the buffer beam and the upper side of the hook. It originated in this way: at a Western car shop, a Pullman car was turned out, which, on inspection, was found to possess this error—the hook being seven inches below the buffer beam. Happening at the shop on the day that the car went out, I called the attention of the master car builder to it; but finding the car was to be used that day in an excursion, and there was not sufficient time to have the error corrected, I advised them to spike a piece of 2-inch plank on the underside of the buffer beam, so that the cars would not be accidentally uncoupled during the excursion. This I did after receiving the promise that it would be changed after the excursion was over; but the car did not come back, and went into service with the plank spiked on the underside of the buffer beam, and since that time a great number of cars on a great number of roads have been equipped in like manner, being copied from this one, and showing most conclusively that the car builders did not properly study the tracings, but were guided by the work (*errors*) of others.

Again, in some instances cars are in use the hooks of which are too low, but the railway men say they work well; and so they will on a



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smooth track, but when off the track, or in case of "*rough track*" producing great vertical motion, the cars will unhook. Again, I have found cars on which are safety chains, and have been told that they were put on because some cars had uncoupled, and, on measuring, I found the cars were all badly equipped, the greatest fault being that of having the hooks too low, also the space between the hook and stop too great. I have found these errors in the *construction* of platforms in a prominent car manufactory, where some of the best of cars are built, and here too it was the result of not heeding the tracings, or rather a forgetfulness arising from a long neglect of looking them over. At one shop which I visited recently, I found some errors, to which I called the attention of the master car builder, and was told they (the platforms) were put up strictly according to the tracings. I asked to be shown the tracings. I was taken upstairs to a table, covered with old brasses and other worn out material, and there beneath this collection was found the tracings, covered to the depth of one-half inch with dust. It was quite evident that *they* had not been very studiously observed.

In some instances it may be necessary, from peculiar construction of cars or a variation in depth of sills, height, &c., to make a slight change in the depth of platform sills, butting 5 inches against the end sill of the car, instead of 6 inches, as per tracings; but a strict observance of the tracings is asked, with the hope that it may result in a great saving to the company using the cars.

Cars equipped in accordance with my shop plans will not uncouple accidentally, on or off the track, excepting by the upsetting of one car; and there is no need of safety chains. In every case which I have heard of, where cars with my improvements have uncoupled, I have found it to be from the causes I have mentioned, or from some breakage of stirrups, or other irons, in a collision or smash up of some kind. I have travelled may hundred miles to find a genuine case of uncoupling, but always found the stories greatly exaggerated; when such a thing has occurred, it has been from the above causes. During a space of seven years, in which the platforms have been in use, I have not been able to learn of a single case of accidental uncoupling where the platforms, &c. were properly constructed, and were in order.

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# HOW TO INSPECT THE PLATFORMS, COUPLERS AND BUFFERS.

Proceed as follows: provide yourself with a 12-inch rule and a small iron bar. Place the iron bar so as to pry the buffer outward; if it cannot be moved, then the key is in its place at the rear end of the shank; if it can be moved, it is because it is not properly keyed, or the spring is broken, or it is good for nothing. Again, pull the hook outward (longitudinally), and then push it back again; if lost motion is found, it is too loose, and either is not properly fitted, or the spring has failed. Then proceed as follows:

1st. If the hook and stop are from $6\frac{3}{4}$ to 7 inches apart, the stirrups and stop are correctly located.

2d. If the hook has 3 inches space in which to move back, the room in the stirrup is right.

3d. If the distance from the top of the hook to the underside of the buffer beam is 5 inches, it is right.

4th. If the hook projects (I mean the center of the hook face) $2\frac{1}{2}$ inches outside of the wood of the buffer beam, it is right.

5th. If the buffer (inside face) projects $2\frac{1}{4}$ inches from the wood of the buffer beam, it is right.

6th. If the pin and chain will hold the hook from "flying back," if struck heavily by an old style draw-head, it is right; otherwise it is wrong and dangerous.

7th. If the lever will draw the hook back to the rear wall of the stirrup, and hold it there—by its ratchet—it is right.

8th. If the hook when "let go" snaps smartly to the center, the main-spring is right. If it does not do so, screw up the heel bolt until it does.

9th. The hand rails should not be more than $2\frac{1}{2}$ feet high, *over all!*

10th. The brake wheels should be 14 inches in diameter, and no more, and should be *at least 7 inches above the handrail, to prevent injury* to the brakeman's hands, when turning curves or on rough track. Be sure to use no cast iron worms on the bottom of the brake shaft;



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the shaft at that part is 1½ inches thick—quite as thick as can be used *to the best advantage* with a 14-inch wheel.

11th. When a platform becomes too low, or hangs down out of line with the car sills, set a jack-screw under the stirrup and strain the platform upward. Then screw up the nuts of the upper truss-rods against the truss-beam, which will hold the platform at the desired level.

## CHECK CHAINS BETWEEN CARS ARE NOT NECESSARY AND SHOULD NOT BE USED.

The "Miller Couplings" are, at all times, and under all circumstances—if correctly made and kept in good order—perfectly reliable as a means of holding the cars together. They will not uncouple (accidentally) on or off the track, running on levels, or up or down steep or high banks; excepting in one case, which is when one car turns over on its side while the next one remains standing up. In such a case one hook has its side (top or bottom) turned to the face of the other hook, which, of course, disconnects the couplings. And in all such cases the couplings *should disconnect*, as in the case of the Long Island R. R. accident, near Willow Tree station. This accident occurred in the month of May, 1869, in which the rear car of a passenger train was thrown from the track by oscillation; turned over on its side and dragged some distance in that position; killing a number of persons by their falling through the windows and being crushed beneath the car as it was drawn over the ground, by the coupling having held it to the car next in front. Had these cars been equipped with Miller Platforms, the couplings would have disconnected as soon as the car turned down on its side, when it would have immediately stopped and there would have been but slight damage done.

On the other hand, take the case of the accident at New Hamburg, on the Hudson River R. R. In that case when the first coach turned over on its side, the couplings parted and the buffer springs, which were compressed by the remaining cars striking heavily upon the cars that were off the track, rebounded, sending the upright cars back on the track several hundred feet, and though they were covered by the burning oil the fire was readily extinguished and the passengers in these cars saved, though some were badly burned by the oil which was thrown against and over them, and run in at the ventilators. Had there been check chains in that case the whole train would have been destroyed. How impossible it is to uncouple accidentally will be apparent when you reflect that we have two reliable couplings—

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each car having its own which securely couples it to the opposite car—which combine to couple one pair of cars—and both of which must fail at the same moment in order to make an accidental uncoupling! Take the main spring and stop from one car, after it is coupled to another, and that other car will keep the coupling between the cars good. I have frequently done this to show the fact to railroad men. But check chains are useful in one important particular. They enable me, when out on my inspecting tours, to discover who does not comprehend these improvements. I never see check chains on Miller Platforms without a feeling of sympathy for the Master Car Builder, who either has not the ability to comprehend what I have said and written to him, and shown him by drawings, tracings and printed directions, which cost me many thousands of dollars, or is unfortunately too inanimate and passive for the position he occupies, or, *what is most likely*, he is tied down by "orders" from his superiors, based on erroneous ideas of economy. As an instance, I will state, that in one case complaint was made to me by a superintendent that cars equipped with my improvements had uncoupled! I immediately visited the company's sheds and yards, and inspected upwards of sixty cars that had been equipped more than three years, and during that time not one dollar's worth of repairs had been put upon them nor had they been inspected by a person competent for such duties.

I found many springs broken, some that required resetting, several hooks bent and levers out of order. I reported the fact to the Master Car Builder, who informed me that he was not before aware of these facts; that the management placed the Master Mechanic over him and that the Master Mechanic appointed the inspectors and repairers. I then went to the Master Mechanic, and found that he was limited to one man to inspect and repair the platforms, &c., of nearly 300 cars. I repeated the facts to the Gen. Supt., and added a little voluntary advice, which did about as much good as such things generally do. The Superintendent shortly after *ordered check chains* to be placed on all the cars. The order was obeyed, and when done, the cost of applying them was far greater than a proper care of the platforms, couplers and buffers would have been. I occasionally ride on that road, but I have never found the chains hooked up, nor the couplings in as good condition as they should be, and yet they seldom give any trouble. Reader, are you a check-chain man? Must you haul cars as you would logs or stone-boats? If so, then be sensible enough to haul them at very slow speed, as logs and stone-boats are hauled by prudent people, and be sure you do not mistake your calling.

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# LETTERS FROM RAILROAD OFFICIALS.

I have received hundreds of letters from railroad officials, who have used the improvements, and all certify in their favor, as will appear from the following exhibit of evidence, selected with regard to brevity:

*Letter from* A. A. FOLSOM, *Supt., Boston & Providence R. R.*

BOSTON, Nov. 30, 1872.

To COL. MILLER,

*Dear Sir:*—Last evening a passenger train from Providence, consisting of eight cars, ran into a freight train within our city limits. The locomotive almost buried itself in a loaded freight car, and many freight cars were smashed up. The passenger train was not injured in the least, for it was fully insured against accident by each car being provided with the "Miller Platform," consequently no passengers were hurt, which fact is of great consolation to me, and I know you will experience a like satisfaction. It is a curious fact that so direct was the blow delivered upon the freight train, that not a wheel left the rails, and one flat car—the tenth from rear end of the train—was found with two additional trucks under it; the body belonging to those trucks, being loaded with merchandise, was nicely and trimly placed on the top of the flat car. This fact I think fully illustrates your theory, that a train provided with the platforms ceases to be so many separate cars, but is practically one car, especially when the train is in motion.

I know you are constantly in receipt of communications of this nature, and it is a pleasure for you to know that you have been, and will yet be the instrument through which humanity will be protected from certain inevitable perils of railway travel. May you live long and enjoy the fruit of your labors. Yours, &c.,

A. A. FOLSOM, *Supt.*



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OWEGO, N. Y., June 26, 1866.

COL. E. MILLER,

*Dear Sir*:—In answer to your telegram of last evening, I report that on Saturday evening, the 23d instant, (about 10.20), passenger train No. 1, Buffalo Express, from New York, then under my charge as conductor, ran off at a point on the Northwestern Division, about nineteen miles from Hornellsville, occasioned by a piece of cast-iron drawhead lodging against the rail and chair. The train consisted of four well-filled coaches, and ran about 400 feet after crossing the rail, when the engine ran into the ground, instantly bringing the train to a stop. Our speed at that time was about at the rate of thirty-five miles per hour. We were running to "*make up*" time, and for want of time no available effect could be made to reduce the momentum of the train. The train remained intact, and no damage was done to either *coaches* or *persons*. The train was made up of cars equipped with the "*Miller Platforms, Couplers*," *&c., throughout*, and to *this fact* I attribute the escape of train, passengers, and employés from damage.

Respectfully, yours,

S. GOSS, *Conductor, Erie R'y.*

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The following is copied from a letter written by Mr. James Wood, and dated at Syracuse, N. Y., Dec. 8th, 1872. Mr. Wood, otherwise known as "Lightning Jim," runs the special Chicago Express on the New York Central R. R., between Rochester and Syracuse, and on the 15th of May, 1872, made the run, without stopping, in eighty-two minutes, the distance being eighty-one miles; which is safely set down as the quickest time on record. It is but justice here to say that Mr. Wood is one of the most careful men on the foot-board that can be found anywhere:

"But I must tell you of the recent accident at Chittenango, which occurred the next evening after Thanksgiving. The stock train going east was ordered to proceed to Manlius, and "side track" for the express to pass; but instead of so doing, the train went on to Chittenango, and stopped at a water tub a little west of the station, where it was overtaken by the express. It had just started, and the entire train had nearly passed the water house, when the express plunged into it, running at a forty mile rate, crushing through three cars, and then leaving the track and going completely through the water house, tearing it entirely down, and burying itself in the ruins. The shock was tremendous; the train bringing up in so short a distance; but there was no injury done to the cars, with the exception

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of the front platform of the postal car, which was next to the tender, and that was but slightly injured, while the tender was completely battered to pieces, there not being enough of it left to repair. All agree that the safety of the passengers was owing to the platforms; and I am happy to add, that during the past four years in which I have run the special train (the cars of which have been equipped with the 'platforms,') they have never given me the slightest trouble about starting or breaking apart. We all consider the Miller Platforms as the greatest safety device ever put upon passenger cars, and that they should be upon every passenger car in the country."

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ALLEGHANY VALLEY RAILROAD,
GENERAL SUPERINTENDENT'S OFFICE,
PITTSBURGH, August 21, 1871.

COL. E. MILLER,

*Dear Sir*:—We have had in use your Patent Trussed Platforms and Compression Buffers on our passenger cars for about two years, and on one or more occasions they have been severely tested without a strain. We would not think of being without them, as with them we feel entirely safe against the possibility of telescoping in case of collision. We find also that the annoyance of jerking, in starting or stopping suddenly, is almost entirely prevented, adding greatly to the comfort of passengers. Your, truly,

J. J. LAWRENCE, *Gen'l Supt.*

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VERMONT CENTRAL RAILROAD,
GENERAL MASTER CAR BUILDER'S OFFICE,
ST. ALBANS, VT., Sept. 2, 1871.

COL. E. MILLER, 231 Broadway, New York,

*Dear Sir*:—We have been using the Miller Platforms on our passenger and baggage cars for about one year, and we consider them the *best preventive against the ordinary accidents caused by oscillation and telescoping*

We have had two opportunities for testing their strength and utility since they have been in use on our cars, and those cars which were equipped with Miller Platforms did not telescope, nor were they materially damaged, nor were the persons on and in them injured. We think if all roads would use your Platforms, a great many painful results of accidents might be avoided. Yours, respectfully,

M. SESSIONS, *Gen'l M. C. B. Vt. C. R. R. Line.*

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CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD CO.
GENERAL SUPERINTENDENT'S OFFICE,
CHICAGO, Sept. 2, 1871.

COL. E. MILLER,

*Dear Sir:*—In answer to your inquiries, as per letter dated August 30, I would reply, that we have had your Patent Car Platform, Coupler and Buffer in use, on our cars, about one year. Have had no accident, nor have I ever known of an instance of cars telescoping when equipped with your improvement.

I regard it as a very valuable invention, and almost a sure preventive to the usual injury and loss of life attending collisions of trains connected by the old fashioned link couplings.

Respectfully, yours,
HUGH RIDDLE, *Gen'l Sup't C. R. I. & P. R. R.*

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TOLEDO, WABASH AND WESTERN RAILWAY CO.,
GENERAL SUPERINTENDENT'S OFFICE,
TOLEDO, OHIO, Sept. 4, 1871.

E. MILLER, ESQ.,

*Dear Sir:*—Your Patent Platform and Buffers have been in use upon the cars on this road nearly one year, and give *perfect satisfaction* to the company. We have had one instance of a passenger train running into a freight train where your platform saved us from a serious smash-up. I think it IMPOSSIBLE for a train to telescope *if equipped with your improvement.* Yours, respectfully,
GEO. H. BURROWS, *Gen'l Sup't.*

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MISSOURI RIVER, FT. SCOTT & GULF R. R.,
SUPERINTENDENT'S OFFICE,
KANSAS CITY, Mo., Sept. 4, 1871.

COL. E. MILLER, 231 Broadway, New York,

*Dear Sir:*—We have used your Trussed Platform and Buffer on this road for over two years, and consider them the greatest improvements of the age. We have had no *accidents* to try ours, but the experience of other roads, in this vicinity, convinces me that no road can afford to be without them. Yours, truly,
B. S. HENNING, *Supt.*

I feel that I cannot say too much for this thing, and if I had my way, would compel every road to use them. I really think there should be a law compelling all roads to use them. B. S. H.

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KANSAS CITY, ST. JOSEPH & COUNCIL BLUFFS R. R. Co.,
SUPERINTENDENT'S OFFICE,
ST. JOSEPH, Mo., Sept. 4, 1871.

*Dear Sir :*—I have your favor of the 30th ult. We have used your Platforms on our road something over two years, and consider them a necessary part of our equipment.

In my opinion they are a perfect preventive of telescoping in case of a collision. Yours, truly, W. L. HOPKINS, *Sup't.*

E. MILLER, ESQ., 231 Broadway, New York City.

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PACIFIC RAILROAD (OF MISSOURI),
OFFICE OF GENERAL SUPERINTENDENT,
ST. LOUIS, Sept. 4, 1871.

MR. E. MILLER, New York,

*Dear Sir :*—We have your Platforms on all our through trains, and are fast fitting up the balance of our coaches. They have proved themselves to be better than we expected. They have already, in one collision, saved us more than all they cost. Switch was turned wrong—express train, running 25 miles per hour, swung in on a siding, striking locomotive of a freight train standing on the side track. Express train consisted of express car, baggage car, four coaches, and two sleepers—eight in all. Our tenders were not then fitted up with proper Buffers, and were attached to the cars by ordinary couplings. The engines were badly damaged, but neither platform of the baggage car (which, as well as the express car, was properly fitted with your Platform and Buffer) were broken or injured. The balance of the train *escaped unharmed,* and proceeded with its passengers to this city.

The conductor, master mechanic, and myself are of the opinion that the Platforms saved at least two or three cars from telescoping, and probably the lives of employes and passengers. A brakeman standing on the platform of the front coach was not hurt—with common platforms he must have been crushed. Yours, &c.,

T. McKISSOCH, *Gen'l Sup't.*

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CHICAGO, BURLINGTON & QUINCY RAILROAD Co.,
GENERAL SUPERINTENDENT'S OFFICE,
CHICAGO, Sept. 5, 1871.

E. MILLER, ESQ.,

*My Dear Sir :*—I have yours of August 30th. Our passenger cars have been equipped with the "*Miller Platform*" for several years, in

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which time we have had three collisions by trains meeting each other and two cases of passenger trains running off the track by reason, of broken rails—in none of which did the cars "*telescope*" or even break down the platforms.

We consider the effectiveness of the arrangement, so far as the prevention of "*telescoping*" is concerned, thoroughly established.

Yours, truly, ROBERT HARRIS, *Gen'l Sup't.*

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NEW YORK CENTRAL RAILROAD,
GENERAL SUPERINTENDENT'S OFFICE,
ALBANY, Sept. 6, 1871.

E. MILLER, ESQ., New York,

*Dear Sir*:—I have yours of August 30th. We have had your Platforms, &c., in use upon the cars of our express passenger trains about two years, and like them very much. In case of collision they are not liable to telescope. Yours, &c.,

J. TILLINGHAST, *Gen'l Supt.*

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LAKE SHORE & MICHIGAN SOUTHERN RAILWAY,
GENERAL SUPERINTENDENT'S OFFICE,
CLEVELAND, OHIO, Sept. 6, 1871.

COL. E. MILLER, 231 Broadway, New York,

*Dear Sir*:—Your Patent Platforms, Couplers and Buffers have been in use on this line since 1866. They have never failed to afford perfect protection against telescoping. I consider the Platform of your style an invaluable addition to a passenger car, affording, as it does, complete safety against passengers or others falling between the cars, and almost absolute prevention of injury to cars and passengers in case of collision, getting off the track, &c., &c. The great steadiness of the trains with this improvement when in motion, is an important feature in its favor. Yours, truly,

CHAS. F. HATCH, *Gen'l Supt.*

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OFFICE MICHIGAN CENTRAL RAILROAD,
CHICAGO, Sept. 6, 1871.

E. MILLER, ESQ., New York,

*Dear Sir*:—In reply to yours of 30th ultimo, I beg to say that it is three years since we commenced the application of your Patent Platform, Coupler and Buffer to our cars and trains, and something more

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